The minimum DO concentration observed was 1.8 mg/L based on 1,498 samples collected between 1 May 2002 through 31 January 2007. The discharge demonstrates reasonable potential to exceed water quality objectives contained in the Basin Plan. Therefore, the daily minimum effluent limitations for dissolved oxygen contained in the previous permit, Order No. R5-2002-0083, are retained in this Order, and are based on the Basin Plan water quality objectives for dissolved oxygen concentrations in the San Joaquin River.

s. **Electrical Conductivity. (see Subsection bb., below, for Salinity)**

t. **Manganese, Total Recoverable.** The applicable water quality objective for manganese contained in Table III-1 of the Basin Plan is 50 µg/L (as dissolved). In the absence of a specific translator for manganese, a translator of 1 is assumed (i.e., the applicable objective for manganese in the total form is equal to 50 µg/L). The MEC for manganese was 180 µg/L (reported as total), based on 23 samples collected between 29 January 2002 and 14 November 2006. The maximum observed upstream receiving water manganese concentration was 240 µg/L (as total), based on 10 samples collected between 20 March 2002 and 4 December 2002.

To determine the assimilative capacity of the San Joaquin River for manganese, the Discharger conducted additional upstream receiving water monitoring during the period 7 December 2005 through 2 August 2006, and measured manganese as total and dissolved. The results of this study were provided as part of their report of waste discharge, and the arithmetic mean of the observed upstream receiving water concentration for dissolved manganese was reported as 7 µg/L. The dissolved data for the receiving water indicates assimilative capacity exists in the receiving water for manganese. Therefore, a dilution credit for manganese of up to 13:1 can be granted, based on the available human health dilution (as discussed in Section IV.C.2.c above). In accordance with 40 CFR 122.45(c), the WQBEL in dissolved form was converted to the total form using the assumed translator of one. Based on the allowable dilution credit, an MDEL of 1308 µg/L is calculated. However, the Regional Water Board finds that granting of this dilution credit could allocate an unnecessarily large portion of the receiving water's assimilative capacity for manganese and could violate the Antidegradation Policy. For this reason, a performance-based effluent limitation (mean plus 3.3 standard deviations) is included in this Order., An MDEL for total manganese of 286 µg/L is included in this Order based on Basin Plan objectives for the protection of human health. Based on the sample results for the effluent, it appears the Discharger can meet this new limitation.

u. **Mercury, Total.** The current USEPA Ambient Water Quality Criteria for Protection of Freshwater Aquatic Life, continuous concentration, for mercury is 0.77 µg/L (30-day average, chronic criteria). The CTR contains a human health criterion (based on a one-in-a-million cancer risk) of 0.050 µg/L for waters from which both water and aquatic organisms are consumed. Both values are controversial and subject to change. In 40 CFR Part 131, USEPA acknowledges that the human health criteria may not be protective of some aquatic or

endangered species and that "*...more stringent mercury limits may be determined and implemented through use of the State's narrative criterion.*" In the CTR, USEPA reserved the mercury criteria for freshwater and aquatic life and may adopt new criteria at a later date.

From 20 March 2002 through 10 January 2007, the Discharger collected 67 effluent samples for total mercury. The maximum observed effluent mercury concentration was 0.013 µg/L (March 2002). The Stockton Deep Water Ship Channel portion of the Delta Waterways, which is about 1.5 miles downstream of the discharge, has been listed as an impaired water body pursuant to Section 303(d) of the Clean Water Act because of mercury. Mercury bioaccumulates in fish tissue, and therefore, the discharge of mercury to the receiving water is likely to contribute to exceedances of the narrative toxicity objective and impacts on beneficial uses. Because the Stockton Deep Water Ship Channel has been listed as an impaired water body for mercury, the discharge must not cause or contribute to increased mercury levels.

The SIP, Section 1.3, requires the establishment of an effluent limitation for a constituent when the receiving stream background water quality exceeds an applicable criterion or objective. Order No. R5-2002-0083 established a mass-based effluent limitation of 0.92 lbs/year for mercury based on the average flow rate for the period (33.2 mgd) and average discharge concentration for the period (0.0094 µg/L). In addition, the Discharger was required to perform an offset program feasibility and development study with the intention of mitigating the mass loading of mercury in effluent above the interim mass limitation. The Facility submitted the study in September 2006. The study identifies potentially feasible and unlikely feasible offset projects. The feasibility is primarily associated with legal liability concerns, regulatory constraints, applicable policies, and unwilling landowners. The report concludes that due to the uncertainty as to the viability of any offset projects, any future TMDL requirements, and future offset policies, it would be premature to propose permit conditions based on the current report. Therefore, the interim mass-based effluent limitation of 0.92 lbs/year is retained in this Order. This limitation is based on maintaining the mercury loading at the current level until a TMDL can be established and USEPA develops mercury standards that are protective of human health. Compliance time schedules have not been included since the discharge currently meets the water quality criteria and the mass limitation. If USEPA develops new water quality standards for mercury, the Regional Water Board adopts a Delta methylmercury TMDL or if the Regional Water Board determines that a mercury offset program is feasible for dischargers subject to a NPDES permit, this Order may be reopened to reevaluate the interim mercury mass loading limitation(s) and the need for a mercury offset program. The previous Order No. R5-2002-0083 established a mercury banking program to allow the Discharger to comply with the terms of that Order, to allow for growth, and to do so in a way that effectively removes the mercury from the watershed. The mercury banking program accumulated the difference between the interim mass limit (0.92 lbs/year) and the mercury mass discharges below that limit, and allowed the accumulative total (banked mercury loadings) to be used to offset mercury loads

above the interim mass limit. At the time the interim mass limit was established, there was relatively little mercury monitoring data to evaluate whether the Discharger could comply with the mass limit over the long term. Based on 67 analytical monitoring results for total mercury collected by the Discharger from 22 May 2002 through 10 January 2007, the annual mass discharge of total mercury was significantly below the 0.92 lbs/year interim limit, and thus, demonstrate that the Discharger can easily meet the mercury interim limit. Therefore, the mercury banking provisions are not necessary.

v. **Molybdenum, Total Recoverable.** Molybdenum is a naturally occurring trace element, and one of 15 elements known to be essential to plant growth. While essential in trace concentrations, excess concentrations are known to bioaccumulate in certain plant species, causing molybdenosis in ruminants (especially cattle) grazing on forage containing concentrations above 10 parts per million (ppm). Studies indicate the impact of molybdenum contamination of forage depends on the quality and amount of irrigation water applied to the field, as well as on the type and leachability of the soil. *Water Quality for Agriculture,* Food and Agriculture Organization of the United Nations—Irrigation and Drainage Paper No. 29, Rev. 1 (R.S. Ayers and D.W. Westcot, Rome, 1985), recommends that the molybdenum concentration in waters used for agricultural irrigation not exceed 10 µg/L. Applying the Basin Plan "Policy for Application of Water Quality Objectives", the numeric standard that implements the narrative objective is the Agricultural Water Quality Goal of 10 µg/L.

The MEC for molybdenum was 13 µg/L, based on 68 samples collected between 19 November 2002 and 10 January 2007. Therefore, the discharge has a reasonable potential to cause or contribute to an in-stream excursion above the Basin Plan's chemical constituents objective. During the period from January 2006 through July 2006, the maximum background concentration of molybdenum was reported as 2.2 µg/L (2 July 2006), and the mean concentration was reported as 1.3 µg/L considering 8 sampling events. Results of the monitoring for molybdenum in the receiving water upstream of the Facility outfall indicate the San Joaquin River has assimilative capacity for molybdenum.

As discussed in Section IV.C.2.c. above, the effluent limitation calculation procedures in Section 1.4 of the SIP allow for the granting of a dilution credit for molybdenum based on the harmonic mean flow of the San Joaquin River and the arithmetic mean flow of the effluent. Based on the allowable dilution credit of up to 13:1, an AMEL and MDEL of 114 µg/L and 198 µg/L, is calculated respectively. However, the Regional Water Board finds that granting of this dilution credit could allocate an unnecessarily large portion of the receiving water's assimilative capacity for molybdenum and could violate the Antidegradation Policy. Using a statistical method (mean plus 3.3 standard deviations), the MDEL is calculated at 11 µg/L; but because it is below the MEC of 13 µg/L, the MDEL for molybdenum established in this Order is 13 µg/L, which is the MEC.

w. **Nitrate plus Nitrite (as N).** Untreated domestic wastewater contains ammonia. Nitrification is a biological process that converts ammonia to nitrite and nitrite to nitrate. Denitrification is a process that converts nitrate to nitrite or nitric oxide and then to nitrous oxide or nitrogen gas, which is then released to the atmosphere. Nitrate and nitrite are known to cause adverse health effects in humans. The California DPH has adopted a Primary MCL at Title 22 of the CCR, Table 64431-A, for the protection of human health for nitrate plus nitrite (sum as nitrogen) of 10,000 µg/L.

USEPA has developed a primary MCL and a MCL goal of 1,000 µg/L for nitrite (as nitrogen). For nitrate, USEPA has developed a Drinking Water Standards Primary MCL and an Ambient Water Quality Criteria for protection of human health non-cancerous effects of 10,000 µg/L. Furthermore, recent toxicity studies have indicated a possibility that nitrate is toxic to aquatic organisms.

Inadequate or incomplete denitrification may result in the discharge of nitrate and/or nitrite to the receiving stream. The conversion of ammonia to nitrites and the conversion of nitrites to nitrates present a reasonable potential for the discharge to cause or contribute to an in-stream excursion above the Primary MCLs for nitrate plus nitrite.

Previous Order No. R5-2002-0083 required the Discharger to evaluate existing and future levels of nitrate in the discharge to determine if it would cause or contribute to an in-stream excursion above a narrative or numeric water quality standard. The Discharger submitted the final report, *Nitrate Analysis for the Stockton Regional Wastewater Control Facility*, dated December 2004. The Discharger states in this report that as the Facility's nitrification system is completed and ammonia concentrations are nitrified, the resulting "*effluent nitrate will likely exceed the MCL value of 10 mg/L during most of the year*". . . but "*will be less than 10 mg/L during the summer months, when the pond removal of both ammonia and nitrate is greatest.* " The Discharger added nitrification facilities, which include biological trickling filter towers with plastic filter medium and engineered wetlands. Both nitrification facilities were on-line by 18 September 2006.

Subsequent samples (72 total) obtained by the Discharger from 18 September 2006 through 31 January 2008, resulted in MECs for nitrate and nitrite of 29 mg/L (29 January 2007) and 4.0 mg/L (14 March 2007), respectively, and a total of 384 samples obtained during this same period resulted in a MEC for ammonia of 17 mg/L (6 January 2007). Based on this data, the discharge has a reasonable potential to cause or contribute to an in-stream excursion above the nitrate plus nitrite criterion.

The maximum observed upstream receiving water nitrate and nitrite concentration was 4.2 mg/L and 0.1 mg/L respectively, based on 162 samples collected between 20 March 2002 and 9 January 2006. These results indicate that the receiving water has assimilative capacity for nitrate plus nitrite. Based on the dilution credit applicable to the human health criteria and the fact that

modeling and field observations have shown that complete mixing is assured prior to the nearest possible drinking water intake, a dilution credit of up to 13:1 may be allowed (see Section IV.C.2.c of this Fact Sheet) in calculation of the WQBELs for nitrate plus nitrite, resulting in an AMEL for nitrate plus nitrite of 113 mg/L. However, allocating the full assimilative capacity for nitrate plus nitrite is not consistent with the Antidegradation Policy (Resolution 68-16), and based on Facility performance, the Discharger can meet a more stringent performance-based effluent limitation. For this reason, a statistically calculated (mean plus 3.3 standard deviations) performance-based effluent limitation is included in this Order. Therefore, based on a mean of 14.8 µg/L and the standard deviation of 7.45 µg/L, an MDEL for nitrate plus nitrite (as N) of 40 mg/L is included in this Order. This effluent limitation is based on the MCL and is necessary to assure the treatment process adequately nitrifies and denitrifies the waste stream to protect the potential beneficial use of municipal and domestic supply.

x. **Oil and Grease.** Untreated domestic wastewater contains oil and grease. The Basin Plan includes a water quality objective for oil and grease in surface waters, which states: "*Waters shall not contain oils, greases, waxes, or other materials in concentrations that cause nuisance, result in a visible film or coating on the surface of the water or on objects in the water, or otherwise adversely affect beneficial uses*". The previous Order included numeric monthly average and daily maximum effluent limitations of 10 mg/L and 15 mg/L, respectively, to implement the Basin Plan's narrative objective for oil and grease. The antidegradation provisions of the State Water Resources Control Board Resolution No. 68-16 state that: " *Any activity which produces or may produce a waste or increased volume or concentration of waste and which discharges or proposes to discharge to existing high quality waters will be required to meet waste discharge requirements which will result in the best practicable treatment or control of the discharge necessary to assure that (a) a pollution or nuisance will not occur and (b) the highest water quality consistent with maximum benefit to the people of the State will be maintained.*" Based on effluent monitoring data obtained from 1 January 2003 through 31 January 2008, a MEC of 14 mg/L and a highest monthly average of 9.5 mg/L have been reported by the Discharger. Therefore, the discharge does not demonstrate a reasonable potential to cause or contribute to an in-stream excursion above the Basin Plan's narrative objective for oil and grease and floating material. This Order removes the effluent limitations for oil and grease based on new information consistent with anti-backsliding requirements of 40 CFR 122.44(l)(2)(i)(B)(*1*). The Regional Water Board finds removing the effluent limitations for oil and grease is consistent with the antidegradation provisions of 40 CFR 131.12 and State Water Board Resolution 68-16. Any impact on existing water quality will be insignificant

y. **Pathogens.** The beneficial uses of the San Joaquin River include, in part, municipal and domestic supply, water contact recreation, and agricultural irrigation supply, and there is, at times, less than 20:1 dilution. To protect these beneficial uses, the Regional Water Board finds that the wastewater must be disinfected and adequately treated to prevent disease. The principal infectious agents (pathogens) that may be present in raw sewage may be classified into

three broad groups: bacteria, parasites, and viruses. Tertiary treatment, consisting of chemical coagulation, sedimentation, and filtration, has been found to remove approximately 99.5% of viruses. Filtration is an effective means of reducing viruses and parasites from the waste stream. The wastewater must be treated to tertiary standards (filtered), or equivalent, to protect contact recreational and food crop irrigation uses.

The California Department of Public Heath (DPH) (formally the Department of Health Services) has developed reclamation criteria, CCR, Division 4, Chapter 3 (Title 22), for the reuse of wastewater. Provision G.1 of the previous Order No. R5-2002-0083 required the Discharger to treat wastewater to Title 22 treatment requirements (or equivalent) by 1 May 2006, which was extended to 25 September 2007 by State Water Board Stay Order and the Court Order. The Discharger has complied with Provision G.1 and currently treats effluent to Title 22 treatment requirements. Title 22 requires that for spray irrigation of food crops, parks, playgrounds, schoolyards, and other areas of similar public access, wastewater be adequately disinfected, oxidized, coagulated, clarified, and filtered, and that the effluent total coliform levels not exceed 2.2 MPN/100 mL as a 7-day median. As coliform organisms are living and mobile, it is impracticable to quantify an exact number of coliform organisms and to establish weekly average limitations. Instead, coliform organisms are measured as a most probable number and regulated based on a 7-day median limitation.

Title 22 also requires that recycled water used as a source of water supply for non-restricted recreational impoundments be disinfected tertiary recycled water that has been subjected to conventional treatment. A non-restricted recreational impoundment is defined as "*...an impoundment of recycled water, in which no limitations are imposed on body-contact water recreational activities.*" Title 22 is not directly applicable to surface waters; however, the Regional Water Board finds that it is appropriate to apply an equivalent level of treatment to that required by DPH's reclamation criteria because the receiving water may be used for irrigation of agricultural land and/or for contact recreation purposes. The stringent disinfection criteria of Title 22 are appropriate since the undiluted effluent may be used for the irrigation of food crops and/or for body-contact water recreation. Coliform organisms are intended as an indicator of the effectiveness of the entire treatment train and the effectiveness of removing other pathogens. The method of treatment is not prescribed by this Order; however, wastewater must be treated to a level equivalent to that recommended by DPH.

In addition to coliform testing, turbidity specifications have been included as a second indicator of the effectiveness of the treatment process and to assure compliance with the required level of treatment. The previous Order No. R5-2002-0083 established effluent limitations for turbidity, including a weekly average of 2 nephelometric turbidity units (NTU), and a daily maximum of 10 NTU. The previous Order No. R5-2002-0083 also prohibited the effluent from exceeding 5 NTU more than 5 percent of the time, and prohibited the effluent from exceeding 10 NTU at any given time if the effluent was continuously monitored. Failure of the filtration system such that virus removal is impaired

would normally result in increased particles in the effluent, which result in higher effluent turbidity. Turbidity has a major advantage for monitoring filter performance, allowing immediate detection of filter failure and rapid corrective action. Coliform testing, by comparison, is not conducted continuously and requires several hours, to days, to identify high coliform concentrations. The limitations in the previous Order No. R5-2002-0083 were solely an operational check to ensure the treatment system was functioning properly and could meet the limits for total coliform organisms. The effluent limitations were not intended to regulate turbidity in the receiving water. Rather, turbidity should be an operational parameter to determine proper system function and not a WQBEL. Therefore, to ensure compliance with the DPH recommended Title 22 disinfection criteria, this Order contains operational turbidity specifications to be met prior to disinfection in lieu of effluent limitations (See Special Provisions VI.C.5.f. Turbidity Operational Requirements in the Limitations and Discharge Requirements section of this Order).

To be consistent with current DPH guidance the operational requirements for turbidity have been established as 2 NTU as a daily average, an instantaneous maximum of 10 NTU, and shall not exceed 5 NTU more than 5 percent of the time. This Order contains effluent limitations and requires a tertiary level of treatment, or equivalent, necessary to protect the beneficial uses of the receiving water. The Regional Water Board has previously considered the factors in CWC section 13241.

z. **Pesticides.** For DDT, Endrin Aldehyde, and Lindane, the CTR includes a criterion of 0.00059 µg/L, 0.76 µg/L, and 0.019 µg/L, respectively, for the protection of human health and is based on a one-in-a-million cancer risk for waters from which both water and organisms are consumed. Based upon available dilution, previous Order No. R5-2002-0083 established maximum yearly total of non-detects (ND) for DDT, Endrin Aldehyde, and Lindane based on the minimum acceptable reporting levels of <0.01 µg/L, <0.01 µg/L, and <0.02 µg/L, respectively.

These pesticides were not detected (<0.002 µg/L) in 66 effluent monitoring samples collected between 20 March 2002 and 26 December 2006. Concentrations of these pesticides were not observed (<0.002 µg/L) in 25 upstream receiving water samples collected between 20 March 2002 and 15 November 2006. Based on new information and the procedures established in Section 1.3 of the SIP for determining reasonable potential, the discharge no longer demonstrates reasonable potential to exceed water quality criteria for DDT, Endrin Aldehyde, and Lindane. The removal of the effluent limitations for these pesticides is in compliance with 40 CFR 122.44(l)(2)(i)(B)(1).

aa. **pH.** The Basin Plan includes a water quality objective for surface waters (except for Goose Lake) that the "*...pH shall not be depressed below 6.5 nor raised above 8.5. Changes in normal ambient pH levels shall not exceed 0.5 in fresh waters with designated COLD or WARM beneficial uses.*" Effluent Limitations for pH are included in this Order based on the Basin Plan objectives for pH.

bb. **Salinity.** The discharge contains total dissolved solids (TDS), chloride, sulfate, and electrical conductivity (EC). These are water quality parameters that are indicative of the salinity of the water. Their presence in water can be growth limiting to certain agricultural crops and can affect the taste of water for human consumption. There are no USEPA water quality criteria for the protection of aquatic organisms for these constituents. The Basin Plan contains a chemical constituent objective that incorporates State MCLs, contains a narrative objective, and contains numeric water quality objectives for EC, TDS, sulfate, and chloride. Table F-5 below summarizes salinity water quality objectives/criteria and effluent concentration values.

Table F-5. Salinity Water Quality Criteria/Objectives

Parameter	Agricultural WQ Goal[1]	Bay-Delta Plan	Secondary MCL[2]	Effluent	
				Avg	Max
EC (µmhos/cm)	Varies[3]	700 (1 Apr-31 Jul) 1000 (1 Aug – 31 Mar)	900, 1600, 2200	1205	1518
TDS (mg/L)	Varies	N/A	500, 1000, 1500	668	730
Sulfate (mg/L)	Varies	N/A	250, 500, 600	120	180
Chloride (mg/L)	Varies	N/A	250, 500, 600	178	210

1 Agricultural water quality goals based on *Water Quality for Agriculture*, Food and Agriculture Organization of the United Nations—Irrigation and Drainage Paper No. 29, Rev. 1 (R.S. Ayers and D.W. Westcot, Rome, 1985)

2 The secondary MCLs are stated as a recommended level, upper level, and a short-term maximum level.

3 The EC level in irrigation water that harms crop production depends on the crop type, soil type, irrigation methods, rainfall, and other factors. An EC level of 700 umhos/cm is generally considered to present no risk of salinity impacts to crops. However, many crops are grown successfully with higher salinities.

The State Water Board's Bay-Delta Plan establishes water quality objectives at various "compliance points" in the estuary to protect beneficial uses. The Bay-Delta Plan at page 10 states: "The water quality objectives in this plan apply to waters of the San Francisco Bay system and the legal Sacramento-San Joaquin Delta, as specified in the objectives. Unless otherwise indicated, water quality objectives cited for a general area, such as for the southern Delta, are applicable for all locations in that general area and compliance locations will be used to determine compliance with the cited objectives." What constitutes "in that general area" is not defined in the Plan.

The two nearest Bay Delta Plan compliance points are the San Joaquin River at Brandt Road Bridge, south of the discharge point along the San Joaquin River, and the San Joaquin River at Prisoner's Point, toward San Francisco Bay from the discharge point. Stockton's discharge is located between these two compliance points. The San Joaquin River at Brandt Bridge and at the discharge point is largely unchanged. The River flows in a relatively shallow, winding channel, and there are not major diversions or tributaries to the River between Brandt Bridge and Stockton. The Brandt Bridge compliance point is established to protect agricultural irrigation uses, and seasonally varies from 700 to 1000 µmhos/cm. The primary use of River Water at both locations is agricultural

irrigation. In contrast, the Prisoner's Point compliance point is located along the Stockton Deep Water Ship Channel where the San Joaquin River has been deepened and straightened. At Prisoner's Point there is seasonally a significant flow of Sacramento River water moving cross-Delta to the pumps near Tracy. The Prisoner's Point compliance point requires the April – May salinity to be maintained at 440 µmhos/cm or less, and is set to protect fish and wildlife beneficial uses. The water quality objectives prescribed for Brandt Road Bridge are judged to be applicable at the site of the Stockton discharge, as being in the "general area" of the compliance point and as having similar River and beneficial use conditions that would make the Brandt Road objective appropriate for beneficial use protection at the discharge point.

i. **Chloride.** The secondary MCL for chloride is 250 mg/L, as a recommended level, 500 mg/L as an upper level, and 600 mg/L as a short-term maximum. The recommended agricultural water quality goal for chloride, that would apply the narrative chemical constituent objective, is 106 mg/L as a long-term average based on Water Quality for Agriculture, Food and Agriculture Organization of the United Nations—Irrigation and Drainage Paper No. 29, Rev. 1 (R.S. Ayers and D. W. Westcot, Rome, 1985). The 106 mg/L water quality goal is intended to protect against adverse effects on sensitive crops when irrigated via sprinklers.

   Chloride concentrations in the effluent ranged from 130 mg/L to 210 mg/L, with an average of 177.5 mg/L, for 12 samples collected by the Discharger from 29 January 2002 through 4 December 2002. Background concentrations in the San Joaquin River ranged from 38 mg/L to 140 mg/L, with an average of 108 mg/L, for 11 samples collected by the Discharger from 20 March 2002 through 4 December 2002. Both the receiving water and the effluent concentrations exceed the agricultural water quality goal of 106 mg/L.

ii. **Electrical Conductivity (EC).** The secondary MCL for EC is 900 µmhos/cm as a recommended level, 1600 µmhos/cm as an upper level, and 2200 µmhos/cm as a short-term maximum. The agricultural water quality goal, that would apply the narrative chemical constituents objective, is 700 µmhos/cm as a long-term average based on Water Quality for Agriculture, Food and Agriculture Organization of the United Nations—Irrigation and Drainage Paper No. 29, Rev. 1 (R.S. Ayers and D.W. Westcot, Rome, 1985). The Bay-Delta Plan's seasonal salinity objectives for the San Joaquin River at Brandt Bridge are 700 µmhos/cm from April through August, and 1000 µmhos/cm from September through March. These objectives are applicable throughout the general geographic area, and, therefore, apply to the Facility's discharge.

   A review of the Discharger's monitoring reports for the last six years (2002 through 2007) shows an average effluent EC of 1205 µmhos/cm, with a range from 946 µmhos/cm to 1518 µmhos/cm for 290 samples. These levels exceed the applicable objectives. The background receiving water EC averaged 602.8 µmhos/cm in 192 sampling events collected by the

Discharger from 20 March 2002 through 9 January 2007, with a maximum high of 1169 µmhos/cm. These data show that the receiving water frequently has no assimilative capacity for EC.

iii. **Sulfate**. The secondary MCL for sulfate is 250 mg/L as a recommended level, 500 mg/L as an upper level, and 600 mg/L as a short-term maximum. Sulfate concentrations in the effluent ranged from 10 mg/L to 180 mg/L, with an average of 119.8 mg/L, for 12 samples collected by the Discharger from 29 January 2002 through 4 December 2002. Background concentrations in the San Joaquin River ranged from 37 mg/L to 130 mg/L, with an average of 86.7 mg/L, for 10 samples collected by the Discharger from 20 March 2002 through 4 December 2002. These concentrations do not exceed the secondary MCL recommended level of 250 mg/L.

iv. **Total Dissolved Solids (TDS)**. The secondary MCL for TDS is 500 mg/L as a recommended level, 1000 mg/L as an upper level, and 1500 mg/L as a short-term maximum. The recommended agricultural water quality goal for TDS, that would apply the narrative chemical constituent objective, is 450 mg/L as a long-term average based on Water Quality for Agriculture, Food and Agriculture Organization of the United Nations—Irrigation and Drainage Paper No. 29, Rev. 1 (R.S. Ayers and D.W. Westcot, Rome, 1985). Water Quality for Agriculture evaluates the impacts of salinity levels on crop tolerance and yield reduction, and establishes water quality goals that are protective of the agricultural uses. The 450 mg/L water quality goal is intended to prevent reduction in crop yield, i.e., a restriction on use of water, for salt-sensitive crops. Only the most salt sensitive crops require irrigation water of 450 mg/L or less to prevent loss of yield. Most other crops can tolerate higher TDS concentrations without harm; however, as the salinity of the irrigation water increases, more crops are potentially harmed by the TDS, or extra measures must be taken by the farmer to minimize or eliminate any harmful impacts.

The average TDS effluent concentration was 668 mg/L; concentrations ranged from 550 mg/L to 730 mg/L for 12 samples collected by the Discharger from 29 January 2002 through 4 December 2002. These concentrations exceed the applicable water quality objectives. The background receiving water TDS ranged from 260 mg/L to 590 mg/L, with an average of 434 mg/L in 10 sampling events performed by the Discharger from 20 March 2002 through 4 December 2002. These data indicate the receiving water frequently exceeds water quality objectives and lacks assimilative capacity for TDS.

As required by previous Order No. R2-2002-0083, the Discharger completed a Wastewater Treatment Feasibility Study (June 2004) and pollution prevention plan (February 2005) for TDS. In the June 2004 report, the Discharger states "it could be argued that the effluent discharge for Stockton's RWCF helps maintain water quality objectives of the Delta.", that "the Discharge will not impact this [Southern one-third of the Delta that is 303(d)

listed] impaired area", and that "further treatment for TDS is unnecessary." However, in both reports, the Discharger provided the following alternatives that could further reduce salinity in the discharge if required:

- Source control:
  1) Actively monitor TDS levels in its drinking water supply wells and reduce the groundwater supply and supplement with surface water if groundwater TDS levels exceed the secondary MCL water quality objective; and
  2) Develop an industrial outreach program to encourage industrial users to reduce TDS levels in the influent.
- Salinity removal processes: Add a pressure driven membrane system to the current treatment process train; however this alternative may pose additional issues with the disposal of the reject brine. Additionally, an estimated $295 million would be required to add these advanced treatment facilities, and annual operation and maintenance costs are estimated at an additional $21.6 million per year. (see section v. Salinity Effluent Limitations below for further discussion)
- Local ordinances: Develop local regulations to ban installation and use of new and existing water softeners and local industrial TDS limits to reduce concentrations in the influent.

v. **Salinity Effluent Limitations.** Effluent limitations based on the MCL, the agricultural water quality goal, or the Basin Plan would likely require construction and operation of a reverse osmosis treatment plant. The State Water Board, in Water Quality Order 2005-005 (for the City of Manteca), states, "*...the State Board takes official notice [pursuant to Title 23 of California Code of Regulations, Section 648.2] of the fact that operation of a large-scale reverse osmosis treatment plant would result in production of highly saline brine for which an acceptable method of disposal would have to be developed. Consequently, any decision that would require use of reverse osmosis to treat the City's municipal wastewater effluent on a large scale should involve thorough consideration of the expected environmental effects.*" The State Water Board states in that Order, "*Although the ultimate solution to southern Delta salinity problems have not yet been determined, previous actions establish that the State Board intended for permit limitations to play a limited role with respect to achieving compliance with the EC water quality objectives in the southern Delta.*" The State Water Board goes on to say, "*Construction and operation of reverse osmosis facilities to treat discharges...prior to implementation of other measures to reduce the salt load in the southern Delta, would not be a reasonable approach.*" In addition, the State Board expressed concerns about costs of reverse osmosis; the same considerations apply to this Facility.

The Regional Water Board, with cooperation of the State Water Board, has begun the process to develop a new policy for the regulation of salinity in the Central Valley. In a statement issued at the 16 March 2006, Regional Water Board meeting, Board Member Dr. Karl Longley recommended that the

Regional Water Board continue to exercise its authority to regulate discharges of salt to minimize salinity increases within the Central Valley. Dr. Longley stated, "*The process of developing new salinity control policies does not, therefore, mean that we should stop regulation salt discharges until a possible interim approaches to continue controlling and regulating salts in a reasonable manner, and encourage all stakeholder groups that may be affected by the Regional Board's policy to actively participate in policy development.*"

As previously described, effluent data for EC and TDS indicate that effluent concentrations continue to be at levels of concern that may affect beneficial uses of the San Joaquin River. Therefore, this Order includes an annual average performance-based effluent limitation of 1300 µmhos/cm for EC to protect the receiving water from further salinity degradation, based on the highest annual average effluent concentration (see Table F-6 below). However, should the Discharger fail to implement the provisional requirements specified in Provision VI.C.3.c of this Order, then this Order requires the Discharger to comply with the seasonal monthly average EC effluent limits of 700 µmhos/cm from April through August and 1000 µmhos/cm from September through March instead, which are based on the Bay-Delta Plan water quality objectives for this geographical location. The Bay-Delta objectives are under review, but when or if the salinity objectives will be changed is unknown. The Regional Water Board must implement water quality objectives as they exist at this time.

Compliance with these effluent limitations and the requirements of Provision VI.C.3.c will result in a salinity reduction in the effluent discharged to the receiving water; however, the discharge may cause or contribute to an exceedance of a water quality objective for salinity until adequate measures are implemented to meet those objectives.

Table F-6. Summary of Annual Electrical Conductivity Effluent Concentrations

Electrical Conductivity (µmhos/cm)				
Year	Count	Min	Avg	Max
2002	40	1144	1264	1420
2003	50	1072	1195	1370
2004	50	1073	1209	1455
2005	48	1004	1229	1355
2006	50	968	1180	1518
2007	52	909	1089	1254

cc. **Settleable Solids.** For inland surface waters, the Basin Plan states that "[w]ater shall not contain substances in concentrations that result in the deposition of material that causes nuisance or adversely affects beneficial uses The previous permit, Order No. R5-2002-0083, required a daily maximum effluent limitation of 0.5 ml/L and a monthly average effluent limit of 0.1 ml/L for settleable solids. Analytical monitoring results obtained since issuance of the previous permit

showed that settleable solids concentration values in 1487 samples monitored during the period from 1 May 2002 through 31 January 2007 did not exceed the effluent limitations. Therefore, the discharge does not demonstrate a reasonable potential to cause or contribute to an in-stream excursion above the Basin Plan's narrative objectives for settleable solids. Based on this new information, this Order does not include effluent limitations for settleable solids; however, this Order requires effluent monitoring and contains a receiving water limitation for Settleable Substances to prevent deposition of material that causes nuisance or adversely affects beneficial uses as described further in section V.A. of this Fact Sheet.

dd. **Temperature**. The Thermal Plan requires that "*The maximum temperature shall not exceed the natural receiving water temperature by more than 20°F.*" Therefore, to ensure compliance with the Thermal Plan, an effluent limitation for temperature is included in this Order.

The Thermal Plan also states "Additional limitations shall be imposed when necessary to assure protection of beneficial uses." In part, beneficial uses applicable to San Joaquin River are migration of aquatic organisms (MIGR) both warm and cold habitats, and warm habitat spawning, reproduction, and/or early development (SPWN).

Previous permits, Orders No. 94-324 and R5-2002-0083, required the Discharger to evaluate the effect of its thermal discharge to migrating fish both within the vicinity of the discharge and downstream (or upstream due to tidal influences), with particular attention being paid to those periods when San Joaquin River flow is lowest and/or San Joaquin River or effluent temperature are highest. In compliance, the Discharger submitted in November 1995 (*Temperature Plan*, Systech 1995) and again in May 2006 (*Potential Thermal Effects of Stockton Regional Wastewater Control Facility Discharge on Migrating Fish in the San Joaquin River,* Jones and Stokes 2006) temperature studies to the Regional Water Board, USEPA, NOAA Fisheries, US Fish and Wildlife Services, and California Department of Fish and Game. These studies, based on data collected between 1988 through 1994 (for November 1995 report) and 2001 through 2005 (for May 2006 report) evaluated potential added stresses from the thermal discharge on the San Joaquin River and the potentially consequential near-field or far-field effects on adult and juvenile Chinook salmon and other migrating fish (i.e. delta smelt, splittail, etc.). Based on these reports, the Regional Water Board finds that additional thermal requirements are not necessary to protect the beneficial uses of San Joaquin River; comments were not received from the other state or federal agencies. Therefore, this Order does not contain additional temperature limitations; however, this Order does retain the previous permit, Order No. R5-2002-0083, temperature effluent and receiving water limitations to comply with the Thermal Plan requirements.

ee. **Tetrachloroethylene (PCE).** The NTR includes a tetrachloroethylene criterion of 0.8 µg/L for the protection of human health, based on a one-in-a-million cancer risk for waters from which both water and aquatic organisms are consumed.

Based upon available dilution, Order No. R5-2002-0083 established an MDEL of 14.5 µg/L.

Tetrachloroethylene was not detected in the effluent discharge, based on 65 samples collected between 20 March 2002 and 10 January 2007, while the maximum observed upstream receiving water tetrachloroethylene concentration was <0.04 µg/L, based on 26 samples collected between 20 March 2002 and 15 November 2007. Therefore, the discharge does not demonstrate a reasonable potential to cause or contribute to an in-stream excursion above the NTR criterion for tetrachloroethylene. Based on new information and the procedures established in Section 1.3 of the SIP for determining reasonable potential, the discharge no longer demonstrates reasonable potential to exceed water quality criteria for tetrachloroethylene. The removal of the effluent limitations for tetrachloroethylene is in compliance with 40 CFR 122.44(l)(2)(i)(B)(1).

ff. **Trichloroethylene (TCE).** The CTR includes a trichloroethylene criterion of 2.7 µg/L for the protection of human health and is based on a one-in-a-million cancer risk for waters from which both water and organisms are consumed. Based upon available dilution, the previous order established an AMEL and MDEL of 14.5 µg/L and 34 µg/L, respectively.

Trichloroethylene was not detected (<0.05 µg/L) in 64 effluent monitoring samples collected between 20 March 2002 and 10 January 2007. Concentrations of trichloroethylene was not observed (<0.2 µg/L) in 26 upstream receiving water samples collected between 20 March 2002 and 15 November 2006. Based on new information and the procedures established in Section 1.3 of the SIP for determining reasonable potential, the discharge no longer demonstrates reasonable potential to exceed water quality criteria for trichloroethylene. The removal of the effluent limitations for trichloroethylene is in compliance with 40 CFR 122.44(l)(2)(i)(B)(1).

gg. **Toxicity.** See Section IV.C.5. of the Fact Sheet regarding whole effluent toxicity.

hh. **Total Trihalomethanes (THMs).** Information submitted by the Discharger indicates that the effluent contains THMs, including chloroform. The Basin Plan contains the narrative "chemical constituent" objective that requires, at a minimum, that waters with a designated MUN use not exceed California MCLs. In addition, the chemical constituent objective prohibits chemical constituents in concentrations that adversely affect beneficial uses. The California primary MCL for total THMs is 100 µg/L. The USEPA primary MCL for total THMs is 80 µg/L, which was effective on January 1, 2002 for surface water systems that serve more than 10,000 people. Pursuant to the Safe Drinking Water Act, DHS must revise the current total THMs MCL in Title 22, CCR to be as low or lower than the USEPA MCL. Total THMs include bromoform, dichlorobromomethane, chloroform, and chlorodibromomethane. The Cal/EPA Office of Environmental Health Hazard Assessment (OEHHA) has published the Toxicity Criteria Database, which contains cancer potency factors for chemicals, including

chloroform, that have been used as a basis for regulatory actions by the regional boards, departments, and offices within Cal/EPA. This cancer potency factor is equivalent to a chloroform concentration in drinking water of 1.1 µg/L (ppb) at the 1-in-a-million cancer risk level with an average daily consumption of two liters of drinking water over a 70-year lifetime.

MUN is a designated beneficial use of the Delta. However, there are no known active drinking water intakes in the San Joaquin River for several miles downstream of the discharge, and chloroform is a non-conservative pollutant. Therefore, to protect the MUN beneficial use of the receiving waters, the Regional Water Board finds that, in this specific circumstance, application of the USEPA MCL for total THMs for the effluent is appropriate, as long as the receiving water does not exceed the OEHHA cancer potency factor's equivalent receiving water concentration at a reasonable distance from the outfall. Typically, in NPDES permits, the OEHHA public health goal is not used to base effluent limitations when there are no active drinking water intakes in the vicinity of the discharge, because chloroform is a volatile organic constituent that will degrade in the environment. If there are no intakes near the discharge, the MCL for total THMs is used with receiving water monitoring for chloroform to determine if the constituent is degrading in the environment before reaching any drinking water intakes.

The MEC for total THMs was 78 µg/L, based on 64 samples. There is only one detection of any of the THMs in the background receiving water (chloroform includes an estimated concentration (i.e. j-flag) of 0.3 µg/L. Therefore, total THMs in the discharge does not have a reasonable potential to cause or contribute to an in-stream excursion above the USEPA primary MCL for total THMs and an effluent limitation is not necessary. The previous Order No. R5-2002-0083 included an effluent limitation for chloroform based on EPA's National Ambient Water Quality Criteria for chloroform (i.e. 5.7 µg/L for consumption of water and organisms). However, USEPA has reserved the National Ambient Water Quality Criteria for water and fish for chloroform and is developing new criteria. Therefore, the primary MCL for total THMs is used to regulate chloroform in NPDES permits at this time. Since the discharge does not have reasonable potential to exceed the primary MCL for total THMs, the effluent limitations for chloroform have not been carried forward to this Order. The removal of the effluent limitations for chloroform is in compliance with 40 CFR 122.44(l)(2)(i)(B)(1).

4. WQBEL Calculations

a. As discussed in Section IV.C.3 above, the annual average effluent limitation for aluminum was based on the Secondary MCL, for protection of the MUN beneficial use, and applied directly. For nitrate plus nitrite, and manganese, performance-based effluent limitation were calculated as the mean plus 3.3 standard deviations based on the most recent monitoring data. For molybdenum, a performance-based effluent limitation was established as the maximum effluent concentration based on the most recent monitoring data.

For EC, a performance-based effluent limitation was established as the highest annual average effluent concentration based on the most recent monitoring data. For ammonia, total coliform, dissolved oxygen, pH, temperature, and chlorine residual, the effluent limitations from the previous Order were carried over.

b. Effluent limitations for aluminum, bis(2-ethylhexyl)phthalate, chlorodibromomethane, cyanide, and dichlorobromomethane were calculated in accordance with section 1.4 of the SIP. The following paragraphs describe the methodology used for calculating effluent limitations for these parameters.

c. **Effluent Limitation Calculations.** In calculating maximum effluent limitations, the effluent concentration allowances were set equal to the criteria/standards/objectives.

$$ECA_{acute} = CMC \qquad ECA_{chronic} = CCC$$

For the human health, agriculture, or other long-term criterion/objective, a dilution credit can be applied. The ECA is calculated as follows:

$$ECA_{HH} = HH + D(HH - B)$$

where:

ECA_{acute} = effluent concentration allowance for acute (1-hour average) toxicity criterion

$ECA_{chronic}$ = effluent concentration allowance for chronic (4-day average) toxicity criterion

ECA_{HH} = effluent concentration allowance for human health, agriculture, or other long-term criterion/objective

CMC = criteria maximum concentration (1-hour average)

CCC = criteria continuous concentration (4-day average, unless otherwise noted)

HH = human health, agriculture, or other long-term criterion/objective

D = dilution credit

B = maximum receiving water concentration

Acute and chronic toxicity ECAs were then converted to equivalent long-term averages (LTA) using statistical multipliers and the lowest is used. Additional statistical multipliers were then used to calculate the maximum daily effluent limitation (MDEL) and the average monthly effluent limitation (AMEL).

Human health ECAs are set equal to the AMEL and a statistical multiplier is used to calculate the MDEL.

$$AMEL = mult_{AMEL}\left[\min\left(\underbrace{M_A ECA_{acute}}_{LTA_{acute}}, \underbrace{M_C ECA_{chronic}}_{LTA_{chronic}}\right)\right]$$

$$MDEL = mult_{MDEL}\left[\min\left(M_A ECA_{acute}, M_C ECA_{chronic}\right)\right]$$

$$MDEL_{HH} = \left(\frac{mult_{MDEL}}{mult_{AMEL}}\right) AMEL_{HH}$$

where: $mult_{AMEL}$ = statistical multiplier converting minimum LTA to AMEL
$mult_{MDEL}$ = statistical multiplier converting minimum LTA to MDEL
M_A = statistical multiplier converting CMC to LTA
M_C = statistical multiplier converting CCC to LTA

WQBELs were calculated for aluminum, bis(2-ethylhexyl) phthalate, chlorodibromomethane, cyanide, and dichlorobromomethane as follows in Tables F-7 through F-11, below.

Table F-7. WQBEL Calculations for Aluminum

	Acute	Chronic
Criteria (µg/L) [1]	750	750
Dilution Credit	No Dilution	No Dilution
ECA	750	750
ECA Multiplier	0.22	0.40
LTA	168.39	303.21
AMEL Multiplier (95th%)	1.85	[2]
AMEL (µg/L)	**311**	[2]
MDEL Multiplier (99th%)	4.45	[2]
MDEL (µg/L)	**750**	[2]

[1] USEPA Ambient Water Quality Criteria
[2] Limitations based on acute LTA (Acute LTA < Chronic LTA)

Table F-8. WQBEL Calculations for Bis(2-ethylhexyl)Phthalate

	Human Health
Criteria (mg/L)	1.8
Dilution Credit	0
ECA	1.8
AMEL (mg/L)[1]	**1.8**
MDEL/AMEL Multiplier[2]	2.01
MDEL (mg/L)	**3.6**

[1] AMEL = ECA per section 1.4.B, Step 6 of SIP
[2] Assumes sampling frequency n<=4. Uses MDEL/AMEL multiplier as determined in Step 5 of Section 1.4 of the SIP.

Table F-9. WQBEL Calculations for Chlorodibromomethane

	Human Health
Criteria (mg/L)	0.41
Dilution Credit	13:1
ECA	4.97
AMEL (mg/L)[1]	**5.0**
MDEL/AMEL Multiplier[2]	3.29
MDEL (mg/L)	**16**

[1] AMEL = ECA per section 1.4.B, Step 6 of SIP
[2] Assumes sampling frequency n<=4. Uses MDEL/AMEL multiplier as determined in Step 5 of Section 1.4 of the SIP.

Table F-10. WQBEL Calculations for Dichlorobromomethane

	Human Health
Criteria (mg/L)	0.56
Dilution Credit	13:1
ECA	6.8
AMEL (mg/L)[1]	**6.8**
MDEL/AMEL Multiplier[2]	3.01
MDEL (mg/L)	**20**

[1] AMEL = ECA per section 1.4.B, Step 6 of SIP
[2] Assumes sampling frequency n<=4. Uses MDEL/AMEL multiplier as determined in Step 5 of Section 1.4 of the SIP.

Table F-11. WQBEL Calculations for Cyanide

	Acute	Chronic
Criteria (µg/L)[1]	22	5.2
Dilution Credit	No Dilution	No Dilution
ECA	22	5.2
ECA Multiplier	0.27	0.46
LTA	5.85	2.40
AMEL Multiplier (95th%)	[2]	1.70
AMEL (µg/L)	[2]	**4.1**
MDEL Multiplier (99th%)	[2]	3.76
MDEL (µg/L)	[2]	**9.0**

[1] USEPA Ambient Water Quality Criteria
[2] Limitations based on chronic LTA (Chronic LTA < Acute LTA)

5. Whole Effluent Toxicity (WET)

For compliance with the Basin Plan's narrative toxicity objective, this Order requires the Discharger to conduct whole effluent toxicity testing for acute and chronic toxicity, as specified in the Monitoring and Reporting Program (Attachment E, Section V.). This Order also contains effluent limitations for acute toxicity and requires the Discharger to implement best management practices to investigate the causes of, and identify corrective actions to reduce or eliminate effluent toxicity.

a. **Acute Aquatic Toxicity.** The Basin Plan contains a narrative toxicity objective that states, "*All waters shall be maintained free of toxic substances in concentrations that produce detrimental physiological responses in human, plant, animal, or aquatic life.*" (Basin Plan at III-8.00) The Basin Plan also states that, "*...effluent limits based upon acute biotoxicity tests of effluents will be prescribed where appropriate...*". USEPA Region 9 provided guidance for the development of acute toxicity effluent limitations in the absence of numeric water quality objectives for toxicity in its document titled "Guidance for NPDES Permit Issuance", dated February 1994. In section B.2. "Toxicity Requirements" (pgs. 14-15) it states that, "*In the absence of specific numeric water quality objectives for acute and chronic toxicity, the narrative criterion 'no toxics in toxic amounts' applies. Achievement of the narrative criterion, as applied herein, means that ambient waters shall not demonstrate for acute toxicity: 1) less than 90% survival, 50% of the time, based on the monthly median, or 2) less than 70% survival, 10% of the time, based on any monthly median. For chronic toxicity, ambient waters shall not demonstrate a test result of greater than 1 TUc.*" Effluent limitations for acute toxicity have been included in this Order as follows:

> Survival of aquatic organisms in 96-hour bioassays of undiluted waste shall be no less than:
>
> | | |
> |---|---|
> | Minimum for any one bioassay---------- | 70% |
> | Median for any three or more consecutive bioassays --------- | 90% |
>
> The previous permit, Order No. R5-2002-0083, contained these same acute toxicity requirements. Based on the weekly acute toxicity test results conducted during December 2003 through January 2007, the Discharger demonstrated compliance with these acute toxicity requirements.

b. **Chronic Aquatic Toxicity.** Based on 116 monthly samples for whole effluent chronic toxicity testing performed by the Discharger from 2 February 2002 through 20 June 2006, the Discharger reported a maximum toxicity result for algal cell density, performed on *Selenastrum capricoruntum*, of greater than 16 TU_c. The Discharger conducted accelerated chronic toxicity testing for *Selenastrum capricornutum* as a result of final effluent toxicity, and conducted the required TIE studies. In January 2005, the Phase I TIE indicated that the effluent contaminant(s) responsible for chronic toxicity to *Selenestrum capricornutum* were primarily organic in nature (January and March 2005, TIE of the City of Stockton Effluent Toxicity to *Selenastrum capricornutum*, Pacific

EcoRisk). Subsequently, Phase II TIE procedures were initiated to identify the organic compound(s) responsible for final effluent toxicity; however, the testing indicated that the toxicity was not persistent (Phase II TIE of Stockton Effluent Toxicity to *Selenastrum capricornutum,* April 2005, Pacific EcoRisk). In total, during the period from March 2002 through March 2007, the Discharger conducted 132 WET tests and 9 TIE tests for Selenastrum capricornutum.

In April 2007, the Discharger concluded the TRE, and submitted the evaluation report to the Regional Water Board, *Assessment of the City of Stockton's Historic Whole Effluent Toxicity Testing and Toxicity Reduction Evaluation Programs for Selenastrum capriconutum*, Jones & Stokes Associates. The TRE identified the toxicant in the *Selenastrum capriconutum* bioassay as ammonia. Recent Facility upgrades that included new nitrification facilities are expected to reduce the occurrence of the toxicant ammonia, and as a result, subsequent accelerated monitoring concluded in October 2007 without further *Selenastrum capricornutum* (algae) toxicity.

Other WET testing data also demonstrated that the effluent discharge from the Facility has reasonable potential to cause or contribute to an in-stream excursion above the Basin Plan's narrative toxicity objective. During the period from 5 March 2002 through 13 June 2006, 52 samples resulted in a maximum toxicity of survival and growth for *Ceriodaphnia dubia* of 2 TU_c and 25 samples resulted in a maximum toxicity of 4 TU_c. No dilution has been granted for the chronic condition. Therefore, chronic toxicity testing results exceeding 1 chronic toxicity unit (TUc) demonstrates the discharge has a reasonable potential to cause or contribute to an exceedance of the Basin Plan's narrative toxicity objective.

Based upon the findings of the extensive WET testing and TIE/TRE, the WET procedure in the MRP allows the removal of the toxicant ammonia prior to conducting the WET analysis.

Numeric chronic WET effluent limitations have not been included in this Order. The SIP contains implementation gaps regarding the appropriate form and implementation of chronic toxicity limits. This has resulted in the petitioning of a NPDES permit in the Los Angeles Region[3] that contained numeric chronic toxicity effluent limitations. To address the petition, the State Water Board adopted WQO 2003-012 directing its staff to revise the toxicity control provisions in the SIP. The State Water Board states the following in WQO 2003-012, *"In reviewing this petition and receiving comments from numerous interested persons on the propriety of including numeric effluent limitations for chronic toxicity in NPDES permits for publicly-owned treatment works that discharge to inland waters, we have determined that this issue should be considered in a regulatory setting, in order to allow for full public discussion and deliberation. We intend to modify the SIP to specifically address the issue. We anticipate that*

[3] In the Matter of the Review of Own Motion of Waste Discharge Requirements Order Nos. R4-2002-0121 [NPDES No. CA0054011] and R4-2002-0123 [NPDES NO. CA0055119] and Time Schedule Order Nos. R4-2002-0122 and R4-2002-0124 for Los Coyotes and Long Beach Wastewater Reclamation Plants Issued by the California Regional Water Quality Control Board, Los Angeles Region SWRCB/OCC FILES A-1496 AND 1496(a)

review will occur within the next year. We therefore decline to make a determination here regarding the propriety of the final numeric effluent limitations for chronic toxicity contained in these permits." The process to revise the SIP is currently underway. Proposed changes include clarifying the appropriate form of effluent toxicity limits in NPDES permits and general expansion and standardization of toxicity control implementation related to the NPDES permitting process. Because the toxicity control provisions in the SIP are under revision, it is infeasible to develop numeric effluent limitations for chronic toxicity. Therefore, this Order requires that the Discharger meet best management practices for compliance with the Basin Plan's narrative toxicity objective, as allowed under 40 CFR 122.44(k).

To ensure compliance with the Basin Plan's narrative toxicity objective, the Discharger is required to conduct chronic whole effluent toxicity testing, as specified in the Monitoring and Reporting Program (Attachment E, Section V.). Furthermore, Special Provisions VI.C.2.a. of this Order requires the Discharger to investigate the causes of, and identify and implement corrective actions to reduce or eliminate effluent toxicity. If the discharge demonstrates a pattern of toxicity exceeding the numeric toxicity monitoring trigger, the Discharger is required to initiate a Toxicity Reduction Evaluation (TRE), in accordance with an approved TRE work plan. The numeric toxicity monitoring trigger is not an effluent limitation, it is the toxicity threshold at which the Discharger is required to perform accelerated chronic toxicity monitoring, as well as, the threshold to initiate a TRE if a pattern of effluent toxicity has been demonstrated.

D. Final Effluent Limitations

1. Mass-based Effluent Limitations

Title 40 CFR 122.45(f)(1) requires effluent limitations be expressed in terms of mass, with some exceptions, and 40 CFR 122.45(f)(2) allows pollutants that are limited in terms of mass to additionally be limited in terms of other units of measurement. This Order includes effluent limitations expressed in terms of mass and concentration. In addition, pursuant to the exceptions to mass limitations provided in 40 CFR 122.45(f)(1), some effluent limitations are not expressed in terms of mass, such as pH and temperature, and when the applicable standards are expressed in terms of concentration (e.g., CTR criteria and MCLs) and mass limitations are not necessary to protect the beneficial uses of the receiving water.

Mass-based effluent limitations were calculated for TSS, $CBOD_5$ and ammonia based upon the permitted average dry weather flow allowed in Section IV.A.1.g. of the Limitations and Discharge Requirements.

2. Averaging Periods for Effluent Limitations

Title 40 CFR 122.45 (d) requires average weekly and average monthly discharge limitations for publicly owned treatment works (POTWs) unless impracticable. However, for toxic pollutants and pollutant parameters in water quality permitting, the

USEPA recommends the use of a maximum daily effluent limitation in lieu of average weekly effluent limitations for two reasons. *"First, the basis for the 7-day average for POTWs derives from the secondary treatment requirements. This basis is not related to the need for assuring achievement of water quality standards. Second, a 7-day average, which could comprise up to seven or more daily samples, could average out peak toxic concentrations and therefore the discharge's potential for causing acute toxic effects would be missed."* (TSD, pg. 96) This Order utilizes maximum daily effluent limitations in lieu of average weekly effluent limitations for aluminum, ammonia, manganese, molybdenum, bis(2-ethylhexyl)phthalate, chlorodibromomethane, cyanide, and dichlorobromomethane as recommended by the TSD for the achievement of water quality standards and for the protection of the beneficial uses of the receiving stream. Furthermore, for TSS, $CBOD_5$, pH, and total coliform organisms, weekly average effluent limitations have been replaced or supplemented with effluent limitations utilizing shorter averaging periods. The rationale for using shorter averaging periods for these constituents is discussed in Attachment F, Section IV.C.3., above.

3. Satisfaction of Anti-Backsliding Requirements

Some effluent limitations in this Order are less stringent than those in the previous permit, Order No. R5-2002-0083. However, since the issuance of Order No. R5-2002-0083, the Discharger upgraded the Facility to provide a higher level of treatment, including a tertiary filtration system. Based upon this new information, as discussed below, this relaxation of effluent limitations is consistent with the anti-backsliding requirements of the CWA and federal regulations.

The previous permit, Order No. R5-2002-0083, established effluent limitations for chloroform; copper; diazinon; dichloromethane; 1,1-dichloroethylene; 4,4-DDT; endrin aldehyde; lindane; oil and grease; settleable matter; tetrachloroethylene (PCE); and trichloroethylene (TCE). Based on new information gathered over the term of Order No. R5-2002-0083, the discharge does not demonstrate reasonable potential to exceed the applicable water quality criteria/objective for these constituents. The removal of these effluent limitations is consistent with the anti-backsliding provisions, and the antidegradation provisions of 40 CFR 131.12 and State Water Resources Control Board Resolution 68-16. Any impact on existing water quality will be insignificant.

Order No. R5-2002-0083 contained effluent limitations for turbidity. The limitations were solely an operational check to ensure the treatment system was functioning properly and could meet the limits for total coliform organisms. The effluent limitations were not intended to regulate turbidity in the receiving water. Rather, turbidity is an operational parameter to determine proper system functioning and not a WQBEL.

This Order contains operational requirements for turbidity to be met prior to disinfection in lieu of effluent limitations. However, the operational requirements in this Order are an equivalent limitation that is not less stringent than the effluent

limitations required in the previous Order No. R5-2002-0083, and therefore does not constitute backsliding.

The proposed revised operational requirements for turbidity are the same as the effluent limitations in Order No. R5-2002-0083 (See Special Provisions VI.C.5.f. Turbidity Operational Requirements). These revisions are consistent with state regulations implementing recycled water requirements.

The revision in the turbidity limitation is consistent with the antidegradation provisions of 40 CFR 131.12 and State Water Board Resolution 68-16 because this Order imposes equivalent or more stringent requirements than Order No. R5-2002-0083 and therefore does not allow degradation.

4. Satisfaction of Antidegradation Policy

Resolution 68-16 and 40 CFR section 131.12 require the Regional Board, in regulating discharge of waste, to maintain high quality waters of the state until it is demonstrated that any change in quality will be consistent with maximum benefit to the people of the state, will not unreasonably affect beneficial uses, and will not result in water quality less than that described in the Regional Water Board's policies (e.g., quality that exceeds water quality objectives). Resolution 68-16 requires the discharge be regulated to meet best practicable treatment or control to assure that pollution or nuisance will not occur and the highest water quality consistent with the maximum benefit to the people of the state be maintained.

Policies and procedures for complying with this directive are set forth in the Basin Plan. Resolution 68-16 is applied on a case-by-case, constituent-by-constituent basis in determining whether a certain degree of degradation can be justified. It is incumbent upon the Discharger to provide technical information for the Regional Water Board to evaluate

Surface Water. With regards to surface water, the receiving water may exceed applicable water quality objectives for certain constituents as described in this Order. However, this Order and TSO Order R5-2008-0155 require the Discharger, in accordance with specified compliance schedules, to meet requirements that will result in the use of best practicable treatment or control of the discharge and will result in compliance with water quality objectives, with the exception of dissolved oxygen. This Order also establishes interim effluent limitations and compliance schedules for pollutants that cannot immediately be controlled to prevent any additional degradation of surface water by these pollutants. The total allowable discharge of 55 mgd has not been increased from the previous permit, Order No. R5-2002-0083, and therefore, does not cause additional degradation beyond that allowed in the previous permit. The discharge is consistent with Resolution 68-16 and 40 CFR section 131.12 because this Order requires the discharger to meet requirements that will result in best practicable treatment or control to assure that pollution or nuisance will not occur. Some degradation is consistent with maximum benefit to the people of the state because the discharge allows for economic or social development in the area.

Groundwater. Groundwater monitoring has been conducted around the Facility; however, additional groundwater quality monitoring results are needed. In addition, certain aspects of wastewater treatment and control practices may not be justified as representative of Best Practicable Treatment and Control (BPTC). Reasonable time is necessary to gather specific information about the Facility to make informed, appropriate, long-term decisions. This Order, therefore, establishes some groundwater limitations to assure protection of beneficial uses of groundwater (see section V.B in the Limitations and Discharge Requirements section of this Order), provisionally requires the Discharger to a corrective action plan and implementation schedule for necessary modifications (see section VI.C.2.c in the Limitations and Discharge Requirements section of this Order), and includes a reopener to consider a revision or addition of the final groundwater limitations if necessary when additional analytical monitoring results or other information are obtained. During this period, degradation may occur from certain constituents, but cannot exceed water quality objectives (or natural background water quality should it exceed objectives) or cause nuisance. For additional information see Section V.B of this Fact Sheet.

Summary of Final Effluent Limitations
Discharge Point No. 001

Table F-12. Summary of Final Effluent Limitations

Parameter	Units	Effluent Limitations				
		Average Monthly	Average Weekly	Maximum Daily	Instantaneous Minimum	Instantaneous Maximum
Aluminum, Total Recoverable	µg/L	311	200[8]	750	--	--
Ammonia Nitrogen, Total (as N)	mg/L	2	--	5	--	--
	lbs/day[2]	917	--	2294	--	--
Bis(2-ethylhexyl)phthalate	µg/L	1.8	--	3.6	--	--
Chlorodibromomethane	µg/L	5.0	--	16	--	--
Chlorine, Total Residual	µg/L	--	0.01[3]	0.02[1]	--	--
Coliform, Total[4]	MPN/100ml	--		--	--	240
Cyanide, Total Recoverable	µg/L	4.1	--	9.0	--	--
Dichlorobromomethane	µg/L	6.8	--	20	--	--
Dissolved Oxygen	mg/L	--	--	--	[7]	--
Flow	mgd	--	--	55[9]	--	--
Manganese, Total Recoverable	µg/L			286		
Molybdenum, Total Recoverable	µg/L		--	13	--	--
Nitrate plus Nitrite (as N)	mg/L	40	--	--	--	--
pH	s.u.	--	--	--	6.5	8.5
Temperature	°F	--	--	[5]	--	--
TSS[6]	mg/L	10	15	20	--	--

Parameter	Units	Effluent Limitations				
		Average Monthly	Average Weekly	Maximum Daily	Instantaneous Minimum	Instantaneous Maximum
	lbs/day[2]	4590	6885	9180	--	--
$CBOD_5$[6]	mg/L	10	15	20	--	--
	lbs/day[2]	4590	6885	9180	--	--

[1] Applied as an average 1-hour limitation.

[2] Mass-based effluent limitations are established using the following formula:
Mass (lbs/day) = flow rate (mgd) x 8.34 x effluent limitation (mg/L)
where: Mass = mass limitation for a pollutant (lbs/day)
Effluent limitation = concentration limit for a pollutant (mg/L)
Flow rate = average dry weather flow (55 mgd)

[3] Applied as a 4-day average limitation.

[4] Effluent total coliform also shall not exceed i.) 2.2 MPN/100ml, as a 7-day median; and ii). 23 MPN/100ml, more than once in any 30-day period.

[5] The maximum effluent temperature shall not exceed the natural receiving water temperature by more than 20°F.

[6] In addition to concentration-based effluent limitations, the arithmetic mean of TSS or $CBOD_5$ in effluent samples collected over a monthly period shall not exceed 15 percent of the arithmetic mean of the values for influent samples collected at approximately the same time during the same period (85 percent removal).

[7] The Discharger shall maintain a minimum daily average effluent DO concentration of 6.0 mg/L from 1 September through 30 November and 5.0 mg/L from 1 December through 31 August.

[8] Annual Average

[9] Average Dry Weather Flow

E. Interim Effluent Limitations

1. **Mercury.** See Section IV.C.3.s. for the rationale for the interim effluent limitations for mercury

F. Land Discharge Specifications

[Not Applicable]

G. Reclamation Specifications

For Order No. R5-2002-0083, the Discharger had requested to be allowed to supply chlorinated secondary treated wastewater for specific reclamation uses, including limited on-site uses such as dust control and compaction by building contractors, street sweeping, and landscape irrigation, in addition to wastewater being used to irrigate 16 acres of agricultural land adjacent to the Facility, which is regulated by WDR Order No. 95-183.

Reclaimed water is required to meet the criteria contained in Title 22, Division 4, CCR (section 60301, et seq.). This Order retains the reclamation requirements contained in the previous Order *to reduce public health concerns and comply with the requirements of Title 22 California Code of Regulations.*

Treated wastewater discharged for reclamation purposes not specified in this Order must be approved by the Executive Officer, or regulated under separate waste discharge requirements, and must meet the requirements of CCR, Title 22.